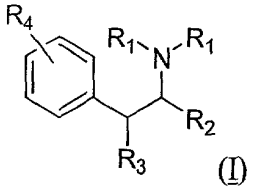
We claim:

1. A pharmaceutical kit comprising one or more amphetamine compound(s) in an amount sufficient to enhance long-term memory in a patient, a pharmaceutically acceptable carrier, and instructions (written and/or pictorial) describing the use of the formulation for enhancing memory.

2. A pharmaceutical preparation comprising one or more amphetamine compounds provided as a single oral dosage formulation in an amount sufficient to enhance long-term memory in a patient but resulting in a concentration in the patient lower than its EC50 as a CNS stimulant.

3. A pharmaceutical preparation comprising one or more amphetamine compounds provided in the form of a transdermal patch and formulated for sustained release of the amphetamine(s) in order to administer an amount sufficient to enhance long-term memory in a patient but resulting in a concentration in the patient lower than its EC50 as a CNS stimulant.

4. The kit of claim 1 or preparation of claims 2 or 3, wherein at least one of the amphetamine compounds is represented by Formula I, or a pharmaceutically acceptable salt, solvate, metabolite or pro-drug thereof:



(I)

wherein, as valence and stability permit,

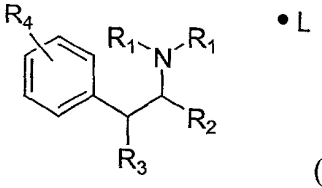
R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido.

5. The kit of claim 1 or preparation of claims 2 or 3, wherein at least one of the amphetamine compounds is a pharmaceutically acceptable salt represented by Formula II:



(II)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

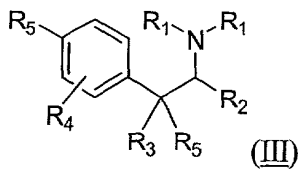
R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido; and

L is a non-toxic organic or inorganic acid.

6. The kit of claim 1 or preparation of claims 2 or 3, wherein at least one of the amphetamine compounds is an amphetamine metabolite represented by Formula III:



(III)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_2 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g.,

optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_3 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, e.g., selected from hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, sulfonamido;

R_5 independently for each occurrence, represents hydrogen or hydroxy.

7. The kits or preparations of claims 4, 5, or 6, wherein one occurrence of R_1 represents hydrogen, the second occurrence of R_1 represents hydrogen, or lower alkyl; R_2 represents hydrogen or lower alkyl, R_3 represents hydrogen or lower alkyl, and R_4 represents hydrogen or from 1 to 2 substituents on the ring to which it is attached, selected from halogen, trifluoromethyl, hydroxy, amino, cyano, nitro, and lower alkyl.

8. The kits and preparations of claim 7, wherein R_4 represents hydrogen and at least one of R_1, R_2, and R_3 represents hydrogen.

9. The kits and preparations of claim 7, wherein R_4 represents hydrogen and at least two of R_1, R_2, and R_3 represent hydrogen.

10. The kits and preparations of claim 7, wherein both occurrences of R_1 represent, independently and for each occurrence, hydrogen, R_2 represents methyl, R_3 represents hydrogen and R_4 represents hydrogen.

11. The kits and preparations of claim 7, wherein one occurrence of R_1 represents hydrogen, the second occurrence of R_1 represents methyl, R_2 represents methyl, R_3 represents hydrogen and R_4 represents hydrogen.

12. The kit of claim 1 or preparation of claims 2 or 3, comprising a single species of amphetamine compound.

13. The kit of claim 1 or preparation of claims 2 or 3, comprising at least two different species of amphetamine compounds.

14. The kit of claim 1 or preparation of claims 2 or 3, wherein said amphetamine compound(s) is provided as at least 51 mol percent of the eutomer of the amphetamine compound with respect to the distomer of that amphetamine compound.

15. The kit of claim 1 or preparation of claims 2 or 3, wherein said amphetamine compound(s) is provided as at least 75 mol percent of the eutomer of the amphetamine compound with respect to the distomer of that amphetamine compound.

16. The kit of claim 1 or preparation of claims 2 or 3, wherein said amphetamine compound(s) is provided as at least 95 mol percent of the of the eutomer of the amphetamine compound with respect to the distomer of that amphetamine compound.

17. The kit of claim 1 or preparation of claims 2 or 3, wherein said amphetamine compound(s) is provided as at least 99 mol percent of the eutomer of the amphetamine compound with respect to the distomer of that amphetamine compound.

18. The kit of claim 1 or preparation of claims 2 or 3, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by a standardized performance test.

19. The kit or preparation of claim 18, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by one or more of a Cambridge Neuropsychological Test Automated Battery (CANTAB); a Children's Memory Scale (CMS); a Contextual Memory Test; a Continuous Recognition Memory Test (CMRT); a Denman Neuropsychology Memory Scale; a Fuld Object Memory Evaluation (FOME); a Graham-Kendall Memory for Designs Test; a Guild Memory Test; a Learning and Memory Battery (LAMB); a Memory Assessment Clinic Self-Rating Scale (MAC-S); a Memory Assessment Scales (MAS); a Randt Memory Test; a Recognition Memory Test (RMT); a Rivermead Behavioral Memory Test; a Russell's Version of the Wechsler Memory Scale

(RWMS); a Test of Memory and Learning (TOMAL); a Vermont Memory Scale (VMS); a Wechsler Memory Scale; and a Wide Range Assessment of Memory and Learning (WRAML).

20. The kit of claim 1 or preparation of claims 2 or 3, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by a Providence Recognition Memory Test.

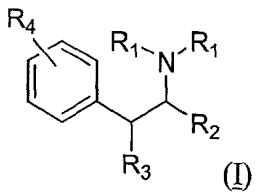
21. The kit of claim 1 or preparation of claims 2 or 3, wherein said one or more amphetamine compound(s) is provided in the form of a saccharate, a sulfate or an aspartate.

22. The kit of claim 1 or preparation of claims 2 or 3, wherein the composition further comprises a neuronal growth factor, a neuronal survival factor, a neuronal trophic factor, a cholinergic modulator, an adrenergic modulator, a nonadrenergic modulator, a dopaminergic modulator, a glutaminergic modulator or an agent that stimulates the PKC, PKA, GABA, NMDA, cannabinoid, AMPA, kainate, phosphodiesterase (PDE), CREB or nootropic pathways.

23. The kit of claim 1 or preparation of claims 2 or 3, wherein the composition further comprises methylphenidate.

24. Use of an amphetamine compound in the manufacture of a medicament for prophylaxis or treatment of an animal susceptible to or suffering from anxiety,

depression, age-associated memory impairment, minimal cognitive impairment, amnesia, dementia, learning disabilities, memory impairment associated with toxicant exposure, brain injury, brain aneurysm, Parkinson's disease, head trauma, Huntington's disease, Pick's disease, Creutzfeldt-Jakob disease, stroke, schizophrenia, epilepsy, mental retardation, Alzheimer's disease, age, attention deficit disorder, attention deficit hyperactivity disorder, or AIDS-related dementia, which amphetamine compound is represented by Formula I, or a pharmaceutically acceptable salt, solvate, metabolite or pro-drug thereof:



(I)

wherein, as valence and stability permit,

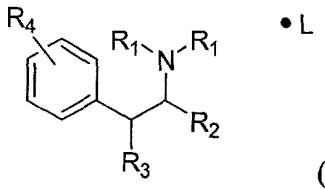
R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido.

25. Use of an amphetamine compound in the manufacture of a medicament for prophylaxis or treatment of an animal susceptible to or suffering from anxiety, depression, age-associated memory impairment, minimal cognitive impairment, amnesia, dementia, learning disabilities, memory impairment associated with toxicant exposure, brain injury, brain aneurysm, Parkinson's disease, head trauma, Huntington's disease, Pick's disease, Creutzfeldt-Jakob disease, stroke, schizophrenia, epilepsy, mental retardation, Alzheimer's disease, age, attention deficit disorder, attention deficit hyperactivity disorder, or AIDS-related dementia, which amphetamine compound is represented by Formula II:



(II)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

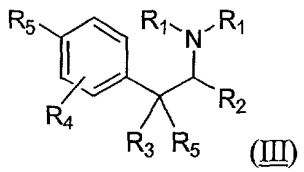
R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido,

acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido; and

L is a non-toxic organic or inorganic acid.

26. Use of an amphetamine compound in the manufacture of a medicament for prophylaxis or treatment of an animal susceptible to or suffering from anxiety, depression, age-associated memory impairment, minimal cognitive impairment, amnesia, dementia, learning disabilities, memory impairment associated with toxicant exposure, brain injury, brain aneurysm, Parkinson's disease, head trauma, Huntington's disease, Pick's disease, Creutzfeldt-Jakob disease, stroke, schizophrenia, epilepsy, mental retardation, Alzheimer's disease, age, attention deficit disorder, attention deficit hyperactivity disorder, or AIDS-related dementia, which amphetamine compound is represented by Formula III:



(III)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_2 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_3 is absent or represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, e.g., selected from hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido;

R_5 independently for each occurrence, represents hydrogen or hydroxy.

27. The use of pharmaceutical composition of claims 24, 25, or 26, wherein one occurrence of R_1 represents hydrogen, the second occurrence of R_1 represents hydrogen, or lower alkyl; R_2 represents hydrogen or lower alkyl, R_3 represents hydrogen or lower alkyl, and R_4 represents hydrogen or from 1 to 2 substituents on the ring to which it is attached, selected from halogen, trifluoromethyl, hydroxy, amino, cyano, nitro, and lower alkyl.

28. The use of pharmaceutical composition of claim 27, wherein R_4 represents hydrogen and at least one of R_1, R_2, and R_3 represents hydrogen.

29. The use of pharmaceutical composition of claim 27, wherein R_4 represents hydrogen and at least two of R_1, R_2, and R_3 represent hydrogen.

30. The uses of pharmaceutical composition of claim 27, wherein both occurrences of R_1 represent independently hydrogen, R_2 represents methyl, R_3 represents hydrogen and R_4 represents hydrogen.

31. The uses of pharmaceutical composition of claim 27, wherein one occurrence of R_1 represents hydrogen, the second occurrence of R_1 represents methyl, R_2 represents methyl, R_3 represents hydrogen and R_4 represents hydrogen.

32. The use of the pharmaceutical composition of claims 24, 25 or 26 for treatment of a mammal.

33. The use of the pharmaceutical composition of claims 24, 25 or 26 for treatment of a human.

34. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein the pharmaceutical composition is for oral administration.

35. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein the pharmaceutical composition is a transdermal patch.

36. The use of the pharmaceutical composition of claim 35, which patch further comprising one or more penetration enhancers.

37. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said amphetamine compound is provided as at least 51 mol percent of the eutomer with respect to the distomer of that amphetamine compound.

38. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said amphetamine compound(s) is provided as at least 75 mol percent of the eutomer with respect to the distomer of that amphetamine compound.

39. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said amphetamine compound(s) is provided as at least 95 mol percent of the eutomer with respect to the distomer of that amphetamine compound.

40. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said amphetamine compound(s) is provided as at least 99 mol percent of the eutomer with respect to the distomer of that amphetamine compound.

41. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said amphetamine compound is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by a standardized performance test.

42. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by one or more of a Cambridge Neuropsychological Test Automated

Battery (CANTAB); a Children's Memory Scale (CMS); a Contextual Memory Test; a Continuous Recognition Memory Test (CMRT); a Denman Neuropsychology Memory Scale; a Fuld Object Memory Evaluation (FOME); a Graham-Kendall Memory for Designs Test; a Guild Memory Test; a Learning and Memory Battery (LAMB); a Memory Assessment Clinic Self-Rating Scale (MAC-S); a Memory Assessment Scales (MAS); a Randt Memory Test; a Recognition Memory Test (RMT); a Rivermead Behavioral Memory Test; a Russell's Version of the Wechsler Memory Scale (RWMS); a Test of Memory and Learning (TOMAL); a Vermont Memory Scale (VMS); a Wechsler Memory Scale; and a Wide Range Assessment of Memory and Learning (WRAML).

43. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by a Providence Recognition Memory Test.

44. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein said one or more amphetamine compound(s) is provided in the form of a saccharate, a sulfate or an aspartate.

45. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein the composition further comprises a neuronal growth factor, a neuronal survival factor, a neuronal trophic factor, a cholinergic modulator, an adrenergic modulator, a nonadrenergic modulator, a dopaminergic modulator, a glutaminergic modulator or an agent that stimulates PKC, PKA, GABA, NMDA, cannabinoid, AMPA, kainate, phosphodiesterase (PDE), CREB or nootropic pathways.

46. The use of the pharmaceutical composition of claims 24, 25 or 26, wherein the composition further comprises methylphenidate.

47. The use of the pharmaceutical composition of claims 24, 25 or 26, the amphetamine compound being provided as a single oral dosage formulation in an amount sufficient to enhance long-term memory in a patient but resulting in a concentration in the patient lower than its EC50 as a CNS stimulant.

48. The kit of claim 1, preparation of claims 2 or 3, or use of the pharmaceutical composition of claims 24, 25 or 26 for treating and/or preventing memory impairment.

49. The kit, preparation or use of the pharmaceutical composition of claim 46, wherein the memory impairment results from one or more of anxiety, depression, age-associated memory impairment, minimal cognitive impairment, amnesia, dementia, learning disabilities, memory impairment associated with toxicant exposure, brain injury, brain aneurysm, Parkinson's disease, head trauma, Huntington's disease, Pick's disease, Creutzfeldt-Jakob disease, stroke, schizophrenia, epilepsy, mental retardation, Alzheimer's disease, age, attention deficit disorder, attention deficit hyperactivity disorder, or AIDS-related dementia.

50. The kit of claim 1, preparation of claims 2 or 3, or use of the pharmaceutical composition of claims 24, 25 or 26 for enhancing memory in normal individuals.

51. The kit of claim 1, preparation of claims 2 or 3, or use of the pharmaceutical composition of claims 24, 25 or 26, wherein the amphetamine compound is (R)-(-)-amphetamine.

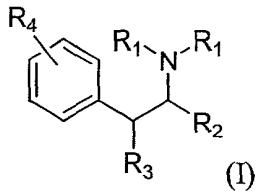
52. The kit of claim 1, preparation of claims 2 or 3, or use of the pharmaceutical composition of claims 24, 25 or 26, wherein the amphetamine compound is (R)-(-)-methamphetamine.

53. A pharmaceutical preparation comprising single oral dosage formulations of 2.5 mg to 125 mg of (R)-(-)-amphetamine and a pharmaceutically acceptable carrier.

54. A pharmaceutical kit comprising single oral dosage formulations of 2.5 mg to 125 mg of (R)-(-)-amphetamine and a pharmaceutically acceptable carrier, and instructions (written and/or pictorial) describing the use of the formulation for enhancing memory.

55. A method for enhancing memory in an animal, comprising administering to the animal a composition of an amphetamine compound in an amount sufficient to enhance long-term memory in the animal, wherein the composition includes at least 51 mol percent of the eutomer of the amphetamine compound with respect to the distomer of that amphetamine compound.

56. The method of claim 55, wherein the amphetamine compound is represented by Formula I, or pharmaceutically acceptable salt, solvate, metabolite or pro-drug thereof:



(I)

wherein, as valence and stability permit,

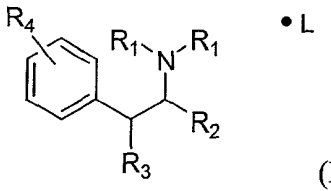
R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido.

57. The method of claim 55, wherein the amphetamine compound is a pharmaceutically acceptable salt represented by Formula II:



(II)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

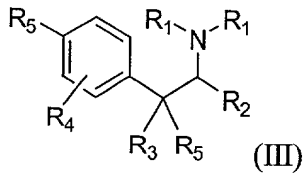
R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido; and

L is a non-toxic organic or inorganic acid.

58. The method of claim 55, wherein the amphetamine compound is an amphetamine metabolite represented by Formula III, or pharmaceutically acceptable salt, solvate, or pro-drug thereof:



(III)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_2 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_3 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, e.g., selected from hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido;

R_5 independently for each occurrence, represents hydrogen or hydroxy.

59. The methods of claims 55-58, wherein one occurrence of R_1 represents hydrogen, the second occurrence of R_1 represents hydrogen, or lower alkyl; R_2 represents hydrogen or lower alkyl, R_3 represents hydrogen or lower alkyl, and R_4 represents

hydrogen or from 1 to 2 substituents on the ring to which it is attached, selected from halogen, trifluoromethyl, hydroxy, amino, cyano, nitro, and lower alkyl.

60. The methods of claims 55-58, wherein R_4 represents hydrogen and at least one of R_1, R_2, and R_3 represents hydrogen.

61. The methods of claims 55-58, wherein R_4 represents hydrogen and at least two of R_1, R_2, and R_3 represent hydrogen.

62. The methods of claims 55-58, wherein both occurrences of R_1 represent independently hydrogen, R_2 represents methyl, R_3 represents hydrogen and R_4 represents hydrogen.

63. The methods of claims 55-58, wherein one occurrence of R_1 represents hydrogen, the second occurrence of R_1 represents methyl, R_2 represents methyl, R_3 represents hydrogen and R_4 represents hydrogen.

64. The method of any of claims 55-58, wherein said amphetamine compound(s) is provided as at least 75 mol percent of the of the eutomer with respect to the distomer of that amphetamine compound.

65. The method of any of claims 55-58, wherein said amphetamine compound(s) is provided as at least 95 mol percent of the eutomer with respect to the distomer of that amphetamine compound.

66. The method of any of claims 55-58, wherein said amphetamine compound(s) is provided as at least 99 mol percent of the of the eutomer with respect to the distomer of that amphetamine compound.

67. The method of any of claims 55-58, wherein said amphetamine compound is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by a standardized performance test.

68. The method of any of claims 55-58, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in a patient by a statistically significant amount when assessed by one or more of a Cambridge Neuropsychological Test Automated Battery (CANTAB); a Children's Memory Scale (CMS); a Contextual Memory Test; a Continuous Recognition Memory Test (CMRT); a Denman Neuropsychology Memory Scale; a Fuld Object Memory Evaluation (FOME); a Graham-Kendall Memory for Designs Test; a Guild Memory Test; a Learning and Memory Battery (LAMB); a Memory Assessment Clinic Self-Rating Scale (MAC-S); a Memory Assessment Scales (MAS); a Randt Memory Test; a Recognition Memory Test (RMT); a Rivermead Behavioral Memory Test; a Russell's Version of the Wechsler Memory Scale (RWMS); a Test of Memory and Learning (TOMAL); a Vermont Memory Scale (VMS); a Wechsler Memory Scale; and a Wide Range Assessment of Memory and Learning (WRAML).

69. The method of any of claims 55-58, wherein said one or more amphetamine compound(s) is provided in an amount sufficient to enhance long-term memory in

a patient by a statistically significant amount when assessed by a Providence Recognition Memory Test.

70. The method of any of claims 55-58, wherein said one or more amphetamine compound(s) is provided in the form of a saccharate, a sulfate or an aspartate.

71. The method of any of claims 55-58, wherein the composition further comprises a neuronal growth factor, a neuronal survival factor, a neuronal trophic factor, a cholinergic modulator, an adrenergic modulator, a nonadrenergic modulator, a dopaminergic modulator, a glutaminergic modulator or an agent that stimulates the PKC, PKA, GABA, NMDA, cannabinoid, AMPA, kainate, phosphodiesterase (PDE), CREB or nootropic pathways.

72. The method of any of claims 55-58, wherein the composition further comprises methylphenidate.

73. The method of any of claims 55-58, the amphetamine compound being provided as a single oral dosage formulation in an amount sufficient to enhance long-term memory in a patient but resulting in a concentration in the patient lower than its EC50 as a CNS stimulant.

74. The method of any of claims 55-58, for treating and/or preventing memory impairment.

75. The method of claim 73, wherein the memory impairment results from one or more of anxiety, depression, age-associated memory impairment, minimal cognitive impairment, amnesia, dementia, learning disabilities, memory impairment associated with toxicant exposure, brain injury, brain aneurysm, Parkinson's disease, head trauma, Huntington's disease, Pick's disease, Creutzfeldt-Jakob disease, stroke, schizophrenia, epilepsy, mental retardation, Alzheimer's disease, age, attention deficit disorder, attention deficit hyperactivity disorder, or AIDS-related dementia.

76. The method of any of claims 55-58 for enhancing memory in normal individuals.

77. The method of any of claims 55-58, wherein the animal is a mammal.

78. The method of claim 77, wherein the animal is a human.

79. A kit comprising an amphetamine compound formulation, e.g., as described herein and preferably provided in single oral dosage form or as a transdermal patch for enhancing memory in a patient (preferably a human), an in association with instructions (written and/or pictorial) describing the use of the formulation for enhancing memory, and optionally, warnings of possible side effects and drug-drug or drug-food interactions.

80. A method for conducting a pharmaceutical business, comprising:

a. manufacturing a kit of claim 1 or preparation of claims 2 or 3; and

b. marketing to healthcare providers the benefits of using the kit or preparation to enhance memory of treated patients.

81. A method for conducting a pharmaceutical business, comprising:

a. providing a distribution network for selling a kit of claim 1 or preparation of claims 2 or 3; and

b. providing instruction material to patients or physicians for using lit or preparation to enhance memory of treated patients.

82. A method for conducting a pharmaceutical business, comprising:

a. determining an appropriate dosage of an amphetamine compound to enhance memory function in a class of patients;

b. conducting therapeutic profiling of one or more formulations of the amphetamine compound identified in step (a), for efficacy and toxicity in animals; and

c. providing a distribution network for selling a the formulations identified in step (b) as having an acceptable therapeutic profile.

83. The method of claim 82, including an additional step of providing a sales group for marketing the preparation to healthcare providers.

84. A method for conducting a pharmaceutical business, comprising:

a. determining an appropriate dosage of an amphetamine compound to enhance memory function in a class of patients; and

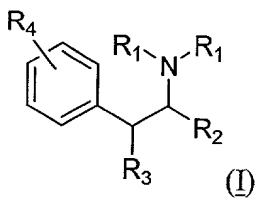
b. licensing, to a third party, the rights for further development and sale of the amphetamine compound for enhancing memory.

85. The method of claim 82, wherein the class of patients suffer from memory impairment.

86. The method of claim 85, wherein the memory impairment results from one or more of anxiety, depression, age-associated memory impairment, minimal cognitive impairment, amnesia, dementia, learning disabilities, memory impairment associated with toxicant exposure, brain injury, brain aneurysm, Parkinson's disease, head trauma, Huntington's disease, Pick's disease, Creutzfeldt-Jakob disease, stroke, schizophrenia, epilepsy, mental retardation, Alzheimer's disease, age, attention deficit disorder, attention deficit hyperactivity disorder, or AIDS-related dementia.

87. The method of claim 82, wherein the class of patients are normal individuals.

88. Solid dosage form comprising an amphetamine compound represented by Formula I, or a pharmaceutically acceptable salt, solvate, metabolite or pro-drug thereof, in an amount of 25 mg or less:



(I)

wherein, as valence and stability permit,

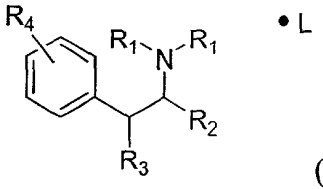
R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido.

89. Solid dosage form comprising a pharmaceutically acceptable salt of an amphetamine compound represented by Formula II, solvate, metabolite or pro-drug thereof, in an amount of 25 mg or less:



(II)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

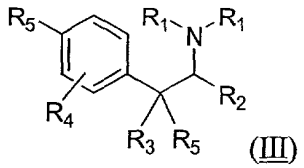
R_2 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_3 represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, ester, amidino, sulfonyl, sulfoxido, sulfamoyl, and sulfonamido; and

L is a non-toxic organic or inorganic acid.

90. Solid dosage form comprising an amphetamine metabolite represented by Formula III, solvate or pro-drug thereof, in an amount of 25 mg or less:



(III)

wherein, as valence and stability permit,

R_1, independently for each occurrence, represents hydrogen or substituted or unsubstituted lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_2 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_3 represents hydrogen or lower alkyl, lower alkenyl, lower alkynyl, aralkyl, aryl, heteroaralkyl, heteroaryl, cycloalkyl, or cycloalkylalkyl, e.g., optionally substituted by one or more substitutents such as halogen, hydroxy, alkoxy;

R_4 represents from 1 to 3 substituents on the ring to which it is attached, e.g., selected from hydrogen, halogen, hydroxy, alkoxy, amino, alkylamino, sulfhydryl, alkylthio, cyano, nitro, ester, ketone, formyl, amido, acylamino, acyloxy, lower alkyl, lower alkenyl, sulfonate ester, amidino, sulfonyl, sulfoxido, sulfamoyl, sulfonamido;

R_5 independently for each occurrence, represents hydrogen or hydroxy.